Location/Identification

MINFILE Number: 092ISE001
National Mineral Inventory Number: 092I7 Cu1
Name(s): **BETHLEHEM**
BETHLEHEM MINE, BETHLEHEM COPPER, BETHLEHEM (JERSEY), JERSEY, HIGHLAND VALLEY COPPER

Status: Past Producer
Mining Method Open Pit
Regions: British Columbia
BCGS Map: 092I046
NTS Map: 092I07W, 092I10W
Latitude: 50 29 53 N
Longitude: 120 59 16 W
Elevation: 1475 metres
Location Accuracy: Within 500M
Comments: Open pit.

Mining Division: Kamloops
Electoral District: Yale-Lillooet
Resource District: Kamloops Forest District

UTM Zone: 10 (NAD 83)
Northing: 5595943
Easting: 642709

Mineral Occurrence

Commodities: Copper, Silver, Gold, Molybdenum

Minerals
Significant: Bornite, Chalcopyrite, Chalcocite, Copper, Cuprite, Molybdenite
Associated: Quartz, Calcite, Zeolite, Pyrite, Specularite, Magnetite, Malachite, Azurite
Associated Comments: Also chrysocolla, hematite and goethite.
Alteration: Biotite, Sericite, Kaolinite, Montmorillonite, Epidote, Chlorite
Alteration Type: Potassic, Argillic, Propylitic, Oxidation
Mineralization Age: Lower Jurassic

Isotopic Age: 199 +/- 8 Ma **Dating Method:** Potassium/Argon **Material Dated:** Biotite

Deposit
Character: Disseminated, Stockwork, Breccia
Classification: Porphyry, Hydrothermal
Type: L04: Porphyry Cu +/- Mo +/- Au
Comments: Age date sample is a mixture of magmatic and hydrothermal biotite from the Iona ore zone (092ISE006) (Canadian Institute of Mining and Metallurgy Special Volume 15, page 114).

Host Rock

Dominant Host Rock: Plutonic

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Triassic-Jurassic	------	------	Guichon Creek Batholith

Isotopic Age	Dating Method	Material Dated
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Lithology: Granodiorite, Quartz Diorite, Breccia, Dacite Porphyry Dike

Geological Setting

Tectonic Belt: Intermontane
Physiographic Area: Thompson Plateau
Terrane: Quesnel

Inventory

Ore Zone: JERSEY **Year:** 1988

Category: Unclassified
Report On: Y
Quantity: 22,900,000 tonnes
NI 43-101: N

Commodity	Grade
Copper	0.4000 per cent

Comments:
Reference: CIM Special Volume 46, page 175.

Ore Zone: TOTAL
Year: 1988
Category: Unclassified
Report On: Y
Quantity: 49,500,000 tonnes
NI 43-101: N

Commodity	Grade
Gold	0.0130 grams per tonne
Copper	0.4000 per cent

Comments: Includes East Jersey, Jersey and Iona.
Reference: CIM Special Volume 46, page 175.

Summary Production

	Metric		Imperial	
Mined:	96,324,510	tonnes	106,179,596	tons
Milled:	92,834,841	tonnes	102,332,895	tons

Recovery	Silver	99,826,893	grams	3,209,509	ounces
	Gold	1,279,833	grams	41,148	ounces
	Copper	398,112,545	kilograms	877,687,923	pounds
	Molybdenum	851,048	kilograms	1,876,240	pounds

Capsule Geology

The Bethlehem property lies within the Early Jurassic-Late Triassic Guichon Creek batholith and straddles an intrusive contact where younger Bethlehem phase rocks form an irregular embayment in older Guichon variety rocks. The Bethlehem phase is medium-grained granodiorite to quartz diorite which ranges from equigranular to hornblende-biotite porphyry. The Guichon variety is medium-grained granodiorite. Igneous breccias are postulated to have been forcefully emplaced. Clasts up to 20 centimetres in diameter are subrounded and sit in a generally compact, but sometimes vuggy matrix. The granodiorites and breccias are intruded by north trending, steeply dipping dykes which are compositionally similar to the enclosing rocks; contacts are chilled. Most of the dykes are dacite porphyry and range in width from less than 1 metre to 60 metres.

The Bethlehem ore deposits (East Jersey (092ISE002), Huestis (092ISE004), Iona (092ISE006), and Snowstorm (092ISE005) are controlled by north trending faults and are localized in zones of closely-spaced fractures. Mineralization is concentrated in breccia bodies, faults and highly fractured areas. The Jersey fault cuts through the centre of the Jersey pit.

Hydrothermal alteration is restricted to the immediate area of the ore zones. The distribution of secondary biotite defines an inner potassic zone, sericite with kaolinite and montmorillonite define an intermediate phyllic zone, and epidote defines a peripheral propylitic zone. There is an outer halo of chloritized mafic minerals. Calcite, zeolite and quartz veining and vug-filling is common.

Metallic mineral zoning is very similar to alteration patterns. Bornite and chalcopyrite occur in the hydrothermal biotite zone, specularite in the epidote zone and minor pyrite in the outer halo. Molybdenite, chalcocite and magnetite occur in minor amounts. Malachite, azurite, chrysocolla, cuprite, native copper, hematite, goethite and manganese oxides occur to shallow depths. An age date from a sample of a mixture of magmatic and hydrothermal biotite from the Iona ore zone (092ISE006) returned 199 Ma +/- 8 Ma (Canadian Institute of Mining and Metallurgy Special Volume 15).

The Jersey orebody hosts disseminated mineralization and occurs in an area of relatively evenly distributed and variously oriented pervasive fracturing. Irregular, discontinuous quartz veins also hosts mineralization. Production from the Jersey pit began in 1964 and from the Jersey pit extension in 1977.

Production from 1963 to 1982 totalled 96,324,510 tonnes, yielding 99,826,893 grams silver, 1,279,833 grams gold, 398,112,545 kilograms copper and 851,048 kilograms molybdenum.

The Bethlehem concentrator milled Valley ore (092ISW012) until its closure in June of 1989.

Reserves for the Jersey deposit are 22.9 million tonnes of 0.40 per cent copper. Total reserves for the Bethlehem deposits (Jersey, East Jersey and Iona) are 43.5 million tonnes (plus 6 million tonnes oxide) grading 0.40 per cent copper, minor molybdenum and 0.013 grams per tonne gold (CIM Special Volume 46, page 175).

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Date Coded:	1985/07/24	**Coded By:**	BC Geological Survey (BCGS)	**Field Check:**	N
Date Revised:	1988/03/11	**Revised By:**	Lori K. Walters (LKW)	**Field Check:**	N